

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of cleaning a treatment chamber connected to a vacuum pump, and a tank of a cleaning agent, comprising:

forming a material including a metal on a wall inside the chamber;

heating the wall;

vaporizing a the cleaning agent comprising one of a carboxylic acid and a derivative of carboxylic acid;

supplying the vaporized cleaning agent into the chamber; ~~such that the vaporized cleaning agent contacts the material to form a metal complex of the metal and the cleaning agent; and~~

forming a metal complex of the metal and the cleaning agent on the heated wall by contacting the vaporized cleaning agent with the material;

subliming the metal complex ~~by using a heat source~~ on the heated wall under a reduced pressure; and

exhausting the sublimed metal complex from the chamber.

2. (Canceled)

3. (Previously Presented) The method of cleaning of claim 1, wherein the cleaning agent comprises a compound selected from the group comprising RCOOH, RCOOR', and R(COOH)_n, wherein R, R' are hydrocarbon groups containing halogen atoms, and wherein n is an integer.

4. (Previously Presented) The method of cleaning of claim 1, wherein the cleaning agent comprises trifluoroacetic acid.

5. (Previously Presented) The method of cleaning of claim 1, wherein the treatment chamber is a component of one of a chemical vapor deposition equipment and a physical vapor deposition equipment.

6. (Currently Amended) The method of cleaning of claim 1, ~~wherein the metal is copper~~
wherein in said vaporizing the cleaning agent, the cleaning agent is vaporized by a vaporizer.

7. (Previously Presented) The method of cleaning of claim 1, further comprising supplying an additive to the vaporized cleaning agent to promote formation of the metal complex of the cleaning agent and the metal.

8. (Currently Amended) The method of cleaning of claim 7, wherein the additive includes oxygen or water vapor.

9. (Currently Amended) A method of cleaning a treatment chamber connected to a vacuum pump, and a tank of a cleaning agent, comprising:

forming a material including a metal on a wall inside the chamber;

heating the wall;

vaporizing a the cleaning agent comprising one of a carboxylic acid and a derivative of a carboxylic acid;

supplying the vaporized cleaning agent into the chamber ~~such that the vaporized cleaning agent contacts the material to form a metal complex of the metal and the cleaning agent;~~

forming a metal complex of the metal and the cleaning agent on the heated wall by contacting the vaporized cleaning agent with the material;

subliming the metal complex ~~by using a heat source~~ on the heated wall under a reduced pressure; and

repeating said vaporizing the cleaning agent, repeating said supplying the vaporized cleaning agent, repeating said forming the metal complex, and repeating said subliming the metal complex; and

exhausting the sublimed metal complex from the chamber.

10. – 16. (Canceled)

17. (Currently Amended) A method of ~~removing a material including a metal~~ cleaning a treatment chamber connected to a vacuum pump, and a tank of a cleaning agent, comprising:

forming a material including copper on a wall inside the chamber;

heating the wall;

vaporizing a the cleaning agent comprising one of a carboxylic acid and a derivative of carboxylic acid;

forming a ~~metal~~ copper complex on the heated wall by contacting a the vaporized cleaning agent with the material including ~~the metal~~ copper; and

subliming the ~~metal~~ copper complex with a heat source; and

exhausting the sublimed copper complex from the chamber.

18. (Currently Amended) The method of ~~removing~~ cleaning of claim 17, wherein, in said subliming the ~~metal~~ copper complex, the ~~metal~~ copper complex is heated at a temperature of at least 150°C.

19. (Currently Amended) The method of ~~removing~~ cleaning of claim 17, wherein, in said forming a ~~metal~~ a copper complex, the pressure of the vaporized cleaning agent is at least 10 Torr.

20. (Canceled)

21. (Currently Amended) The method of cleaning of claim 17 ~~claim 1~~, further comprising:

confirming the existence of the material inside the chamber; and

repeating said vaporizing the cleaning agent, repeating said supplying the vaporized cleaning agent, and repeating said subliming the ~~metal~~ copper complex, if the existence of material inside the chamber is confirmed.

22. (New) The method of cleaning of claim 17, wherein in forming the material, the material including copper is formed from Cu^{+1} (hexafluoroacetylacetonate) and silylolefin ligand.

23. (New) The method of cleaning of claim 22, wherein the silylolefin ligand is selected from the group consisting of trimethylvinylsilane (TMVS), dimethoxymethylvinylsilane (DMOMVS), methoxydimethylvinylsilane (MODMVS), trimethoxyvinylsilane (TMOVS), triethoxyvinylsilane (TEOVS), ethoxymethoxymethylvinylsilane (EOMOMVS),

diethoxymethylvinylsilane (DEOMVS), diethoxymethoxyvinylsilane (DEOMOVVS), ethoxydimethoxyvinylsilane (EODMOVVS), ethoxydiethylvinylsilane (EODEVS), diethoxyethylvinylsilane (DEOEVS), dimethoxyethylvinylsilane (DMOEVS), ethoxydimethylvinylsilane (EODMVS), methoxydiethylvinylsilane (MODEVS) and ethylmethoxymethylvinylsilane (EMOMVS).

24. (New) The method of cleaning of claim 9, wherein the cleaning agent is a compound selected from the group comprising RCOOH , RCOOR' , and $\text{R}(\text{COOH})_n$, wherein R and R' are hydrocarbon groups containing a halogen atom and n is an integer.

25. (New) The method of cleaning of claim 9, wherein the cleaning agent comprises trifluoroacetic acid.

26. (New) The method of cleaning of claim 17, wherein the cleaning agent is a compound selected from the group comprising RCOOH , RCOOR' , and $\text{R}(\text{COOH})_n$, wherein R and R' are hydrocarbon groups containing a halogen atom and n is an integer.

27. (New) The method of cleaning of claim 17, wherein the cleaning agent comprises trifluoroacetic acid.

28. (New) The method of cleaning of claim 1, wherein in said heating the wall, the wall is heated at a temperature of at least 300 °C.

29. (New) The method of cleaning of claim 9, wherein in said heating the wall, the wall is heated at a temperature of at least 300 °C.

30. (New) The method of cleaning of claim 17, wherein in said heating the wall, the wall is heated at a temperature of at least 300 °C.